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Bonaparte, 1970

Description



Restored skull

Pterodaustro has a very elongated skull, up to 29 centimetres long. The portion in front of the eye sockets comprises 85% of skull length. The long snout and lower jaws curve strongly upwards; the tangent at the point of the snout is perpendicular to that of the jaw joint. *Pterodaustro* has about a thousand bristle-like modified teeth in its lower jaws that might have been used to strain crustaceans, plankton, algae, and other small creatures from the water.^[2] These teeth stand for the most part not in separate alveoli but in two long grooves parallel to the edges of the jaw. They have a length of three centimetres and are oval in cross-section, with a width of just 0.2–0.3 millimetres. At first it was suspected these structures were not

true teeth at all, but later research established they were built like normal teeth, including enamel, dentine and a pulp. Despite being made of very hard material, they might still have been flexible to some extent due to their extreme length-width ratio, a bend of up to 45° being possible.^[3] The upper jaws also carried teeth, but these were very small with a flat conical base and a spatula-formed crown. These teeth also do not have separate tooth sockets but were apparently held by ligaments in a special tooth pad, that was also covered with small ossicles, or bone plates.

The back of the skull was also rather elongated and in a low position; there are some indications for a low parietal crest.

Pterodaustro had an adult wingspan of approximately 250 centimetres (8.20 ft).^[4] Its hindlimbs are rather robust and its feet large. Its tail is uniquely elongated for a pterodactyloid, containing 22 caudal vertebrae, whereas other members of this group have at most sixteen.

Paleobiology

Pterodaustro probably strained food with its tooth comb, a method called "filter feeding", also practised by modern flamingos.^[5] Once it caught its food, *Pterodaustro* probably mashed it with the small, globular teeth present in its upper jaw. Like other ctenochasmatoids, *Pterodaustro* has a long torso and proportionally massive and splayed hindfeet, adaptations for swimming.^[6]

Robert Bakker suggested that, like flamingos, this pterosaur's diet may have resulted in a pink hue.^[7]

At least two specimens of *Pterodaustro* have been found, MIC V263 and MIC V243, with gizzard stones in the stomach cavity, the first ever reported for any pterosaur. These clusters of small stones with angled edges support the idea that *Pterodaustro* ate mainly small, hard-shelled aquatic crustaceans using filter-feeding. Such invertebrates are abundant in the sediment of the fossil site.^[8]

A study of the growth stages of *Pterodaustro* concluded that juveniles grew relatively fast in their first two years, attaining about half of the adult size. Then they reached sexual maturity, growing at a slower rate for four to five years until there was a determinate growth stop.^[9]



Life restoration

In 2004 a *Pterodaustro* embryo in an egg was reported, specimen MHIN-UNSL-GEO-V246. The egg was elongated, six centimetres long and 22 millimetres across and its mainly flexible shell was covered with a thin layer, 0.3 mm thick, of calcite.^[10] Three-dimensionally preserved eggs were reported in 2014.^[11]

Comparisons between the scleral rings of *Pterodaustro* and modern birds and reptiles suggest that it may have been nocturnal and similar in activity patterns to modern anseriform birds that feed at night.^[12]

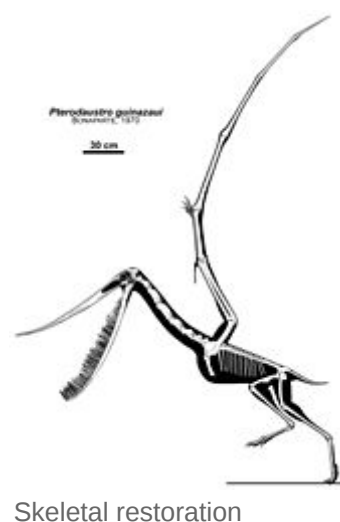
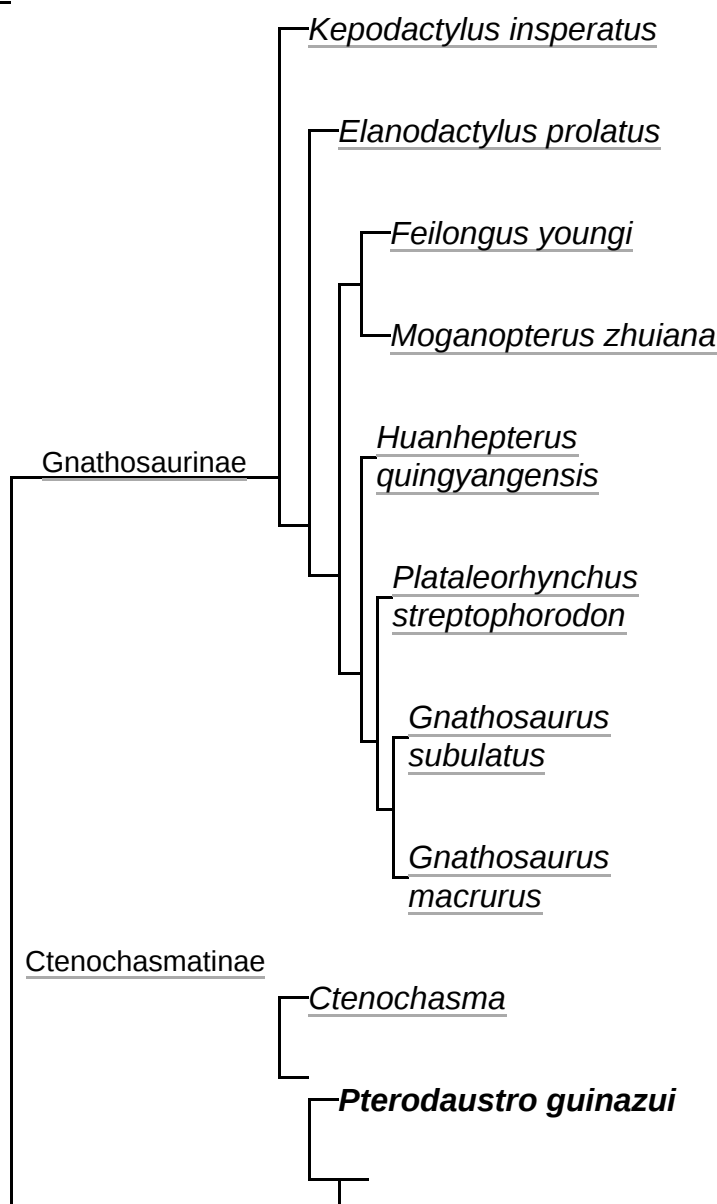
Because of its long torso and neck and comparatively short legs, *Pterodaustro* was unique among pterosaurs in having difficulties to launch. Even with the pterosaurian quadrupedal launching mechanism, it would have required frantic and fairly-low angled take-offs possible only in open areas, much like modern geese and swans.^[6]

Phylogeny

Bonaparte in 1970 assigned *Pterodaustro* to the Pterodactylidae; in 1971 to a Pterodaustriidae. However, from 1996 cladistic studies by Alexander Kellner and David Unwin have shown a position within the family Ctenochasmatidae, together with other filter feeders.^[6]

Cladogram following Andres, Clark & Xu, 2014.^[13]

Ctenochasmatidae



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External links

- [Giants of the Mesozoic: Pterodaustro \(https://web.archive.org/web/20051017082111/http://www.fernbank.edu/museum/giants/Pterodaustro.html\)](https://web.archive.org/web/20051017082111/http://www.fernbank.edu/museum/giants/Pterodaustro.html)

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